

an active semiconducting layer over the active dielectric layer, wherein the active dielectric layer comprises a low-temperature cured high-speed deposition product of at least silsesquioxane precursor; and

a source electrode and a drain electrode in contact with the active semiconducting layer.

### **REMARKS**

Claims 1-19 are pending in this application, and of these, claims 13-18 stand withdrawn from consideration upon election of claims 1-12 and 19 pursuant to the Restriction Requirement mailed October 1, 2001. The specification is amended to add a recitation of the FET device claimed in 19. Thus, claim 19, as filed, fully supports this amendment. The drawings are amended by including new FIG. 3, which is simply an illustration of the FET device claimed in claim 19. Thus claim 19, as filed, fully supports new FIG. 3. Claim 19 is amended such that the phrase "the active dielectric layer" in lines 4-5 of the claim now has the correct antecedent basis. Since all the amendments are fully supported by the application as filed, there is no issue of new matter. Applicants reserve the right to prosecute non-elected claims 13-18 in one or more continuing or divisional applications.

#### **I THE OBJECTION UNDER 37 C.F.R. § 1.83**

Claims 1, 10, and 19 have been objected to under 37 C.F.R. § 1.83 on the grounds that the claimed "field effect transistor" is not shown in drawings. FIG. 3 submitted herewith for inclusion in the application shows all claimed elements. Accordingly, Applicants respectfully request the Examiner to withdraw the objection.

#### **II THE REJECTIONS UNDER 35 U.S.C. § 112**

Claims 1-12 and 19 stand rejected under 35 U.S.C. § 112 on the grounds that they are indefinite for failing to more precisely describe the field effect transistor in the claim.

Independent claims 1 and 10 stand rejected as indefinite on the grounds that they claim a "field effect transistor" without reciting its elements. Applicant respectfully requests that the rejection be withdrawn because this is an improper basis for rejection. The Federal Circuit has set forth that "whether a claim is invalid of indefiniteness requires a determination whether those skilled in the art would understand what is claimed when the claim is read in light of the specification". *Morton Int'l v. Cardinal Chem. Co.*, 5 28 U.S.P.Q.2d. 1190 (Fed. Cir. 1993); *In*

*re Larsen*, WL 493429, \*2 (Fed. Cir. 2001). This is recognized by the PTO in MPEP § 2173.02, which recites that the essential issue is whether one of ordinary skill in the art would recognize the claims' scope in view of the prior art and specification. The meaning of the phrase "field effect transistor" is clear to those of skill in the art. As described in the specification at page 4, last paragraph, field effect transistors are known in the prior art. In light of this discussion, Applicants respectfully request that the § 112 rejection be withdrawn.

Claim 19 stands rejected on the grounds that there is not antecedent bases for the phrase "the active dielectric layer" in lines 13-14. Claim 19 has been amended to replace "layer of insulating material" at line 12 and "insulating layer" at line 13 with "active dielectric layer". This amendment is fully supported by the specification at page 6, lines 17-20, thus, there no issue of new matter. Since there is now antecedent basis for the claim-19 phrase "the active dielectric layer", Applicants respectfully request that the § 112 rejection of claim 19 be withdrawn.

### III THE REJECTIONS UNDER 35 U.S.C. § 102 AND § 103


Claims 1-4, 6-12, and 19 stand rejected under 35 U.S.C. § 102 and § 103 on the grounds that they are anticipated or rendered obvious in view of U.S. Patent No. 5,953,627 to Carter ("Carter") or rendered obvious in view of the combination of Carter with U.S. Patent No. 5,016,982 to Ferguson ("Ferguson"). Applicants' claims are directed to field effect transistors comprising a dielectric layer formed by low-temperature cure of a silsesquioxane precursor. Carter, on the other hand, is directed to an integrated circuit device comprising a dielectric material formed by high-temperature cure of a silsesquioxane precursor. Carter's silsesquioxane dielectric material is completely different than Applicants dielectric layer. Carter discloses preparing his dielectric material by cross condensing an silsesquioxane precursor in the presence of an organic amine having a boiling point of greater than 150 °C then heating to remove the amine. Indeed, Carter teaches heating the precursor film to over 400 °C (see, e.g., col. 4, lines 65-67). At this temperature, not only does the amine evaporate, the alkyl residues of the silsesquioxane are oxidized leaving a silicon dioxide type dielectric film. In contrast to Carter, Applicants do not use an organic amine to catalyze silsesquioxane cure. More significantly, directly the opposite to Carter's teachings, Applicants cure the silsesquioxane precursor at low temperature (i.e., less than 200 °C, preferably, less than 150 °C), see e.g., page 8, lines 17-18. As a result, Applicants' dielectric layer maintains the organic radicals of the silsesquioxane

precursors. Accordingly, the Applicants' dielectric layer is completely different chemically and in properties from Carter's dielectric material. This is reflected in Applicants' claim 1, which requires that the active dielectric layer comprise a "low-temperature cured film". In sum, Carter does not teach using a low-temperature cure and thus cannot anticipate Applicant's claimed invention. For a reference to anticipate, it must contain each and every element of the claimed invention. *Advance Display Sys. v. Kent State Univ.*, 212 F.3d 1272 (Fed. Cir. 2000). In view of this discussion, the Examiner is respectfully requested to withdraw the 35 U.S.C. § 102 rejection over Carter.

Furthermore, Carter provides no suggestion or motivation to use a low-temperature cure and thus cannot render Applicants claimed invention obvious under 35 U.S.C. § 103. To support obviousness, a reference must suggest to one of ordinary skill in the art that the claimed invention could be carried out with a reasonable likelihood of success. Both the suggestion and the expectation of success must be founded in the prior art. *In re Dow Chem. Co.*, 837 F.2d 469, 472 (Fed. Cir. 1988). Ferguson does not remedy Carter since it also fails to teach or suggest a dielectric layer comprising a low-temperature cured silsesquioxane film. Ferguson is directed to a liquid crystal display connected in series with a capacitor and contains no mention of silsesquioxanes. In view of this discussion, the Examiner is respectfully requested to withdraw the 35 U.S.C. § 103 rejections over Carter and over Carter in view of Ferguson.

In view of the above remarks and amendments, reconsideration is requested and a speedy allowance is earnestly sought. No fee is required for entry of this Reply; if any fee is due however, please charge the required fee to deposit account number 501358. Attached is a request under 37 C.F.R. 1.136 for a one-month extension with authorization for the required fee.

Respectfully submitted,

  
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EXHIBIT A: Marked Up Version Of The Amended Portion Of The Specification

Insertions are indicated by underlined text and deletions are indicated by strikcout text.

~~FIG. 1 is a graph plotting current-voltage (I-V) values for an inventive FET device using pentacene as the semiconducting layer and bottom-contact micro-contact printed gold (Au) electrodes; and~~

~~FIG. 2 is a graph plotting field-effect mobilities for inventive FET devices using copper phthalocyanine (CuPc) as the active semiconducting layer and top-contact micro-contact printed silver (Ag) electrodes.~~

FIG.1 is a graph plotting current-voltage (I-V) values for an inventive FET device using pentacene as the semiconducting layer and bottom-contact micro-contact printed gold (Au) electrodes;

FIG. 2 is a graph plotting field-effect mobilities for inventive FET devices using copper phthalocyanine (CuPc) as the active semiconducting layer and top-contact micro-contact printed silver (Ag) electrodes; and

FIG. 3 illustrates an FET device of the invention.

EXHIBIT A: Marked Up Version Of The Amended Claim

Insertions are indicated by underlined text and deletions are indicated by strike-out text.

19. (amended) An article comprising an organic FET comprising:  
a gate electrode on a substrate;  
an active dielectric layer ~~a layer of insulating material~~ over the substrate;  
an active semiconducting layer over the ~~insulating layer~~ active dielectric layer, wherein  
the active dielectric layer comprises a low-temperature cured high-speed deposition product of at  
least silsesquioxane precursor; and  
a source electrode and a drain electrode in contact with the active semiconducting layer.